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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,976	05/22/2006	Youngchul Park	33082M295	1618

441 7590 10/31/2007
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WASHINGTON, DC 20036

EXAMINER

ADAMS, BRET W

ART UNIT	PAPER NUMBER
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4122

MAIL DATE	DELIVERY MODE
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10/31/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/561,976

Applicant(s)

PARK ET AL.

Examiner

Bret Adams

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :12/22/2005, 09/22/2006, 08/09/2007.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because all reference numerals should be put in parentheses. Correction is required. See MPEP § 608.01(b).
2. The disclosure is objected to because of the following informalities:
 - The section title for Background Art contains a spelling error. In the specification it is spelled "BACKGORUND"
 - Beginning on page 10, line 2 of the specification, the wafers are referred to by "W." However, page 18 line 24, page 19 lines 9, 36, page 20 line 3 refer to "temperature-monitoring wafers" or "dummy wafers" and use the same reference letter "W." The specification should be corrected to maintain consistent language for descriptions of the same structural feature.
 - On page 20 line 27, the temperatures "TR1 to TR5" are not represented in any figures. The examiner considers it a typographical error, and not an error in the figures themselves.

Appropriate correction is required.

Claim Objections

1. Claim 4 is objected to because of the following informalities: "calibrating step" is repeated twice in the fourth limitation of the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 8-10, 13-14, 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki (US PG Pub 2002/0014483 A1).

4. Regarding claims 1-4, 8-9, 13, and 17 Suzuki teaches a calibration method for a heat treatment apparatus that performs a heat treatment on process objects comprising a processing vessel (2) for accommodating process objects (W), a plurality of heaters (3) and a plurality of temperature sensors (S_{in} , S_{out} , S_{wc} , and S_{we}). The heat treatment apparatus stores a thermal model in a model storing part (111) based on the outputs of the temperature sensors. The apparatus estimates the temperature of the process object in the vessel based on outputs of the temperature sensors, and controls the heaters based on the estimated temperature (refer to col. 6 lines 55-60). The processing vessel, in operation, compares temperatures according to the thermal model and the actual measurements, and provides a correction value so that the difference between the estimated values and the actual measured temperatures is a minimum (col. 9, lines 12-29). During the calibration process, temperature sensors (S_{wc} and S_{we}) are arranged adjacent to the process objects (W), enabling the measurement of the process objects' temperatures (col. 10, lines 42-54). When heating the processing vessel, the heaters sequentially set the interior of the processing vessel at a preset temperature of a plurality of levels, calibrating the model as discussed above for each temperature value (col. 10, lines 55-60).

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5. Regarding claim 5, 10, 14, and 18, Suzuki teaches the heat treatment apparatus as discussed above, and further teaches that the thermal model has a function of estimating the temperature of the heaters using temperature sensors (S_{out}) as well as the temperatures of the temperature sensors (S_{in}) (col. 11, lines 1-5 and referring to the use of the measured values in the equation of col. 10 lines 64-65). The sensors S_{in} and S_{out} are both bases for the calibration method. S_{out} sensors are located closest to the heater. Correction values are determined as discussed above.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 6-7, 11-12, 15-16, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki (US PG Pub 2002/0014483 A1) in view of Muka (US 6193506).

8. Regarding claims 6-7, 11-12, 15-16, and 19-20, Suzuki teaches the heat treatment apparatus and calibration method in which there are correction values calculated based on measured temperature of the heaters and temperature sensor readings as discussed above (also Suzuki col. 6, lines 55-60). Suzuki does not teach arranging a heater inside the processing vessel. Muka teaches arranging heaters (28) in several locations within the processing vessel, above and below the processing objects. It would have been obvious for a person of ordinary skill in the art at the time of the

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invention to combine the external (to the vessel) heating system of Suzuki with the internal heaters of Muka, because doing so would provide predictable results of precisely-controllable vessel and process object temperature by minimizing thermal gradient above and below the processing objects within the vessel. Additionally, the temperature sensors (S_{in} , S_{wc} and S_{we}) of Suzuki are already in position to measure temperatures of the heaters of Muka and as such will be used in the calibration method already described above (also Suzuki col. 10, lines 29-38). In this way the elements of Suzuki and Muka retain their original function when used together.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Saito (US 09/882255) discloses a vertical oxidation processing unit with similar structure and heater arrangement as the instant application. Makiya (US 10/473248) discloses a heat treating device with very similar structure as the instant application and similar motivations. Ozaki (US 5498292) discloses a heat treatment mechanism with similar structure and function as the instant application.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bret Adams whose telephone number is 571-270-5028. The examiner can normally be reached on M-F 8am-5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Robinson can be reached on 571-272-2319. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BA


MARK ROBINSON
SUPERVISORY PATENT EXAMINER